



**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY  
REGION 8**  
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Ref: 8EPR-ER

**ACTION MEMORANDUM**

**SUBJECT:** Documentation of an Emergency Removal Action at the Gold King Mine Release Site, San Juan County, Colorado initiated pursuant to the On-Scene Coordinator's delegated authority under CERCLA Section 104 and a Request for Approval and Funding of a Continued Removal Action including a 12-Month and \$ 2 Million Exemption

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Site ID# A8K9

**I. PURPOSE**

The purpose of this Action Memorandum is to document the decision to initiate an emergency removal action pursuant to the On-Scene Coordinator's delegated authority under CERCLA Section 104 and request and document approval and funding of a continued removal action and exemption from the 12-Month and \$2 million statutory limit for the ongoing activities described herein for the Gold King Mine Release Site (Site) which has its origin in Gladstone, San Juan County, Colorado. This removal action involves, but may not be limited to: stabilizing the Gold King Mine waste rock dump, temporary treatment of the acid mine discharge in treatment ponds, removal of waste rock deposited in Cement Creek from the Gold King mine release, flow control measures in the adit/portal, ground control for the underground workings, treatment of the acid mine

discharge in an interim water treatment system through the winter and precautionary measures such as the provision of alternative water supplies, and provision of feed for livestock.

This emergency removal action was implemented following the release of approximately 3 million gallons of accumulated acid mine water from within the Gold King Mine into Cement Creek which is a tributary to the Animas River. Removal actions to stabilize the Gold King Mine site are continuing and monitoring of the watershed to assess potential impacts from the release continues. There continues to be a threat or potential threat to public health and the environment such that the criteria for initiating and continuing a removal action continues to exist under 40 CFR 300.415(b)(2) of the National Contingency Plan (NCP).

In accordance with the Superfund Removal Guidance for Preparing Action Memoranda (“AM Guidance”) (OSWER Sept. 2009), removal actions that may affect other sovereign nations, including Indian Tribes, are issues of national significance, and require concurrence from the EPA Office of Solid Waste and Emergency Response. This emergency removal action is considered nationally significant or precedent setting as the release may have affected the Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe, and the Navajo Nation as the acid mine water from this release flowed down the Animas River and San Juan River watersheds.

## **II. SITE CONDITIONS AND BACKGROUND**

Site Name:	Gold King Mine Release
Superfund Site ID (SSID):	A8K9
NRC Case Number:	1124824
CERCLIS Number:	TBD
Site Location:	Gladstone, San Juan County, Colorado
Lat/Long:	37.8946/-107.6384
NPL Status:	Non NPL
Removal Start Date:	8/5/2015

### **A. Site Description**

#### **1. Removal Site Evaluation**

The Gold King Mine is located within the Cement Creek watershed, a component of the upper Animas River watershed. These watersheds are within the volcanic terrain of the San Juan Mountains and contain some 400 abandoned or inactive mine sites, which have been the focus of both large and small scale mining operations that flourished between 1871 and 1991.

The Gold King Mine, Red and Bonita Mine, and Mogul Mine, all inactive mines close to the Sunnyside Mine, experienced significant increases in acid mine drainage following the construction of concrete bulkheads in the Sunnyside

Mine/American Tunnel between 1995 and 2002. The bulkheads were placed as part of the State approved closure plan for the Sunnyside Mine.

The Animas River and many of its tributaries, including Cement Creek, carry elevated concentrations of hazardous substances (heavy metals) from both acid rock/mine drainage at mine sites and from natural sources not impacted by mining. The Animas River flows to the San Juan River, which is impacted by other sources of hazardous substances from additional mine sites and natural sources.

This emergency removal action is associated with a release of acid mine water containing heavy metals from the Gold King Mine. This release was triggered during an EPA removal assessment on August 5, 2015. An EPA Team was excavating soil covering the bedrock approximately ten feet above the collapsed adit. The task to expose the bedrock above the collapsed portal was being performed as one of the initial steps to prepare to reopen the Gold King Mine Level 7 portal and workings to investigate the mine conditions, assess the on-going releases and stabilize the portal by removing the debris blockage. In addition, the secondary purpose of this assessment was to attempt to identify and characterize specific water flows into the mine and evaluate potential means to mitigate those flows if possible. This was being performed in advance of the plan to close the valve in the bulkhead being placed in the nearby Red and Bonita mine, which was scheduled to be complete by September 30, 2015.

During these initial activities, EPA observed that mine water began flowing from the soil slope near the bedrock above the collapsed adit. Before any measures could be taken to control the release at the portal, the flow increased and a significant discharge of acid mine water began flowing out of the portal down the mountain and into Cement Creek.

It is estimated that approximately three (3) million gallons of acid mine water was released into Cement Creek which is a tributary to the Animas River. The primary environmental concern from this spill was the short-term pulse of contaminated acid mine water containing sediment and heavy metals which presented a potential threat to the downstream portions of the Animas River (Colorado, Southern Ute Indian Tribe, and New Mexico), San Juan River (New Mexico, Navajo Nation, Ute Mountain Ute Indian Tribe), and Lake Powell (Utah, Navajo Nation, Arizona). These rivers and lake are used for drinking water, irrigation water, and various recreational uses, including fishing and boating. The spill was visible flowing as an orange-colored release downstream through Silverton and Durango, Colorado, and into New Mexico. The discolored water was substantially diluted as the Animas River joined the San Juan River (near Farmington, NM) as significant water was released from the Navajo Lake Dam into the San Juan River.

## **2. Physical Location**

The Gold King Mine is in the Cement Creek watershed which originates in the rugged San Juan Mountains in San Juan County, Colorado. The portal is approximately 9 miles north of the town of Silverton, Colorado, at 11,386 feet above mean sea level (AMSL). The latitude is 37.8945 and longitude is -107.6384. Average snowfall at the mine site is approximately 12 feet per year and construction seasons are of limited duration, typically July through mid-October.

### 3. Site Characteristics

The San Juan Mountains within the Cement Creek watershed were the focus of both large- and small-scale mining operations that flourished beginning in 1871 and continuing until 1991. The Sunnyside Gold Mine operated until 1991 and conducted water treatment on the discharge from the American Tunnel that ranged from approximately 1400 to 2100 gallons per minute (gpm). After the American Tunnel was extended to the Sunnyside Gold Mine workings around 1960, there was little to no flow of water from the three closest inactive mines (Gold King (Level 7) Mine, Red and Bonita Mine, and Mogul Mine) in the Cement Creek basin above the American Tunnel. In 1995, the Sunnyside Gold Corporation installed, pursuant to its reclamation mining permit, the 1<sup>st</sup> of 3 plugs (bulkheads) in the American Tunnel. The 2<sup>nd</sup> and 3<sup>rd</sup> plugs were installed in 2001 and 2002, respectively. The flow from all three inactive mines experienced significant increases following the plugging of the American Tunnel. In addition, even after plugging, the American Tunnel continued to flow at about 100 gpm. From 2009 to the present, the combined flows from the Mogul, Red and Bonita, Gold King mine adits and the American Tunnel into Cement Creek have ranged from 600 to 800 gpm. Water quality in the Animas River has been degraded progressively since that time.

The Animas River and many of its tributaries, including Cement Creek, carry high concentrations of metals from both acid rock/mine drainage at mine sites and from natural sources not associated with mining. Water quality studies have indicated that the Gold King Mine is one of the major sources of metals to the Animas River near Silverton. The EPA, United States Bureau of Land Management (BLM) and United States Geological Survey (USGS) have undertaken activities to more fully quantify the various mine site sources and to quantify diffuse metal sources within the mining district that contribute to the metals loading to the Animas River.

The Gold King Mine adit is collapsed, which prevented accessing the workings to evaluate the source of water discharging from the mine. Investigation of the disturbed slope and hillside above the adit showed no sign of water seepage. Three portal areas are associated with the Gold King Mine: the Level 7, Number 1, and Samson portals. In the 1980s a bypass adit (new portal) was driven by the mine owner at Level 7 to bypass a collapse in the original tunnel. All four portals

were dry until after the American Tunnel was bulkheaded.

In 2007 the mine drainage from the Level 7 portal breached the existing ditch and saturated the top of the Level 7 waste rock pile leading to a slope failure.

In 2008, the State of Colorado Division of Reclamation, Mining, and Safety (DRMS) moved the ditch, directing water toward the east face of the waste rock pile, and lined it with half round, high density polyethylene (HDPE) pipe.

In 2009 both the old and new Level 7 portals, which had been partially collapsed, were backfilled by DRMS. An observation pipe and a drainage pipe were installed in the old portal, but during closure the timbers in the portal collapsed, burying the pipes. The drainage pipe continued to drain at roughly 200 gpm, the same flow rate as was observed prior to the collapse. Also in 2009, a concrete ditch was installed to receive discharge from the old portal and a 3-inch parshall flume was installed between the concrete ditch and half round HDPE pipe.

Discharge from the old portal flowed from the discharge pipe into the cement culvert, through the flume, into the half round HDPE pipe, down the east face of the waste rock pile, and into the North Fork of Cement Creek. Intermittent discharges from the new portal flowed through a small channel and over the site access road. The North Fork of Cement Creek joins with the main stem of Cement Creek downstream of the Red and Bonita Mine.

Since about 2009, EPA and BLM have been conducting investigations, assessments and sampling efforts in the Upper Animas Mining District Site, which includes the Gold King Mine, in an effort to better understand the many potential sources contributing to degradation of water quality of the Animas River downstream from Silverton. As part of these efforts, since 2009, the flow from the Gold King Mine has been sampled two times each year (spring and fall) for water quality parameters, flow volume, and total and dissolved metals. During this time, discharge rates from the Gold King 7<sup>th</sup> Level adit have been observed to range from 112 to 252 gpm. The discharge water pH ranged from 2.3 to 5.1 standard units. Discharge from the Gold King 7 Level adit contains high concentrations of cadmium (36.1 micrograms per liter ( $\mu\text{g/L}$ ) to 138  $\mu\text{g/L}$ ), copper (2450  $\mu\text{g/L}$  to 12,100  $\mu\text{g/L}$ ), aluminum (7200  $\mu\text{g/L}$  to 60,000  $\mu\text{g/L}$ ), iron (46,700  $\mu\text{g/L}$  to 257,000  $\mu\text{g/L}$ ), manganese (23,500  $\mu\text{g/L}$  to 34,200  $\mu\text{g/L}$ ), and zinc (13,000  $\mu\text{g/L}$  to 41,900  $\mu\text{g/L}$ ) (concentrations measured from 2009 through 2014).

The results of a Screening Level Ecological Risk Assessment (February 2013) strongly suggested that the fish community in the Animas River at and below Silverton would experience high stress under conditions at the time of the assessment. For example, the surface water hazard quotient for zinc in the Animas River below the confluence with Cement Creek was approximately 4, which is four times the expected no-effects level. In addition, the study identified aluminum, copper, lead, and zinc as the major risk drivers to insectivorous birds ingesting surface water, sediment, and aquatic invertebrates from the Animas

River at and below Silverton. Metal concentrations measured in the substrate of the Animas River at and below Silverton were expected to be highly toxic to benthic invertebrates. Fish population studies conducted by the Colorado Division of Wildlife at the same time as the assessment found no fish in the Animas River below Cement Creek for approximately 2 miles.

In August/September 2014, the EPA initiated a removal assessment at the Gold King Mine in order to assess the collapsed portal and begin the process to rehabilitate the portal to allow assessment of the sources of water in the mine before bulkhead work occurred at the Red and Bonita. The Animas River Stakeholders Group (ARSG), Colorado Division of Reclamation and Mining Safety, BLM and local governments were all consulted and briefed on EPA's removal action at the Red and Bonita Mine and planned assessment of the Gold King Mine and agreed it was appropriate to evaluate the ongoing acid mine drainage from the Gold King Mine into Cement Creek before changing conditions with a bulkhead closing at the Red and Bonita Mine.

In August and early September 2014, EPA constructed a lined retention pond at the base of the southeast corner of the waste dump to capture solids that will likely be released during the portal excavation, rehabilitation, and initial mine entries.

During the week of August 25, 2014, flow from the Gold King Mine through the flume was approximately 112 gpm. On September 11, 2014, prior to any excavation work at the adit, the flow was less than 12.6 gpm and the intermittent discharge west of the primary discharge point was less than 5 gpm.

On September 11, 2014, EPA began work to reopen the mine tunnel from the existing adit. The excavation work was stopped when it was determined that there was more impounded water than anticipated behind the portal blockage. After inspection by EPA, EPA's contractors, and DRMS, it was determined that the water would need to be managed in a larger settling pond(s).

On September 12, 2014, EPA installed piping to capture the ongoing mine drainage and direct it to the existing drainage system previously installed by DRMS. The installed piping was secured in place with geo-fabric, crushed rock, and quick dry concrete. The portal area was then backfilled with crushed rock and compacted to stabilize the area around the portal for future work. EPA then demobilized at the Site as seasonal weather would limit the ability to conduct additional work. At the conclusion of the 2014 work, EPA determined that the water management system to be operated during mine entry would be re-evaluated.

The EPA remobilized to the mine site in July, 2015. The Gold King Mine discharge flow measured at 69 gpm. On July 24, 2015, the EPA's ERRS contractor began grading the mine dump.

On July 29, 2015 the pipeline and pump supplier visited the mine site to discuss options for pumping water from the Gold King to the Red and Bonita treatment ponds. Various options were considered and the vendor planned to supply the ERRS contractor with options. That afternoon the ERRS contractor removed some loose material from above the assumed portal location in an attempt to find native bedrock.

On July 30, 2015 the ERRS contractor had removed material above the collapsed pipes to the back of them, leaving the top of the top pipe covered and ceased investigation.

On August 4, 2015 EPA OSC and DRMS personnel arrived at the Gold King Mine to discuss how to proceed with the site. The decision was made to begin excavating the collapse area while minimizing water discharge. That afternoon a set of collapsed timbers with what appeared to be an opening was uncovered. The situation was left to be considered overnight.

The morning of August 5, 2015, the EPA and DRMS personnel discussed the mine adit situation and determined that excavation should be continued. DRMS personnel stated that due to the severity of the collapse a series of plates might need to be used to build the 10 foot culvert further back into the mine beyond the collapse to allow dewatering and water treatment. DRMS personnel left the site to investigate the bulkhead in the nearby Mogul Mine.

Soon thereafter, a small leak was observed approximately 15 to 20 feet above the anticipated elevation of the floor of the adit. Work stopped and the excavator moved back from the excavation area. The hole had begun to enlarge and water was pouring out resulting in the catastrophic release of acid mine water from the Gold King Mine. The release was later estimated at approximately 3 million gallons. The release of the mine water washed out a substantial volume of material from the Gold King Mine waste rock dump into the North Fork of Cement Creek and Cement Creek. The release entered into Cement Creek which is a tributary to the Animas River.

EPA Region 8 personnel at the Gold King Mine site made immediate notifications via two way radio to other EPA Region 8 personnel working at the Red and Bonita site nearby and told them to keep everyone away from the gulch and creek where the flow was headed. The OSC then sent one of them to get the Colorado State DRMS personnel, who had left the Gold King Mine site a short time before the release to look at another mine. The State DRMS personnel made all the necessary immediate notifications to the Colorado Spill Notification System with the Colorado Department of Public Health and the Environment (CDPHE) and the National Response Center. CDPHE notified downstream users in the State of Colorado. The Southern Ute Indian Tribe, which has a reservation south of Durango, was notified as well as irrigation system users along the Animas River. The La Plata County Sheriff issued an order closing the Animas River to all watercraft from the north County line (San Juan County, Colorado) to the south

County line (at the Colorado/New Mexico State line). Furthermore, all such watercraft were to be removed from the Animas River within the locations cited above. The Sheriff made this decision after consultation with the EPA, CDPHE, the San Juan Basin Health Department, and representatives of the Southern Ute Indian Tribe.

Immediately after the release, the EPA team at the Gold King Mine Site began taking steps to stabilize conditions at the mine. EPA Region 8 was also able to quickly initiate water quality sampling of the watershed as a sampling team was in the area for another project and were immediately diverted to begin taking water quality samples from the Animas River.

On August 6, 2015, EPA Region 8 made notifications to EPA Regions 6 and 9. These Regions made notifications to the New Mexico Environment Department and Navajo Nation. EPA Region 8 also made notifications to the State of Utah, and the Ute Mountain Ute Indian Tribe.

#### **4. Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant**

Since at least 2009, the Gold King Mine has discharged water with low pH and heavy metals, including but not limited to cadmium, copper, aluminum, iron, manganese, and zinc. A variety of metals were detected at elevated levels in Cement Creek the evening after the release including zinc, copper, lead, arsenic, manganese and iron. All of these are listed as hazardous substances per 40 CFR §302.4, with the exception of iron.

#### **5. NPL Status**

The Site is not on the NPL.

#### **6. Maps, Pictures, Other Geographic Representations**

See Map of Site

See Site Photos

### **B. Other Actions to Date**

#### **1. Previous Actions**

Until undertaking the removal assessment discussed above, EPA had periodically sampled the water coming from the Gold King Mine. As described above, the Colorado DRMS conducted some reclamation activities at the Gold King Mine due to forfeiture of a previous bond on this mine as described above in II.A.3.

#### **2. Current Actions**

Since the release, EPA has constructed a series of settling ponds to treat the mine water flowing from the portal. The road to the mine site has been repaired and made structurally sound, preparations at the mine entrance are ongoing to stabilize and structurally enhance the surrounding portal.

The EPA and its response partners have conducted significant sampling within the Animas and San Juan Rivers and Lake Powell, which includes water quality samples within the Rivers and Lake, sediment samples within the Rivers and Lake, water quality and sediment samples within potentially influenced irrigation ditches, water quality samples of shallow private wells that are potentially influenced by the river due to their close proximity to the river, and public drinking water intakes within the river as determined by EPA with consultation with its response partners regarding whether such sampling was appropriate. EPA also conducted sampling of some public drinking water wells at the request of its response partners. EPA has provided alternative drinking water for human consumption, livestock consumption, and for irrigation purposes in varying degrees to areas where use of water from the Animas and San Juan River was restricted. Additionally, feed for livestock was provided where open grazing livestock were fenced in to restrict access to the river system.

EPA Region 9 utilized a cooperative agreement with the Bureau of Indian Affairs (BIA) to assist with distribution of livestock water on the Navajo Nation

## **C. State, Tribal, and Local Authorities' Role**

### **1. State, Tribal, and Local Actions to Date**

State, Tribal, and Local authorities have provided a considerable amount of assistance to EPA by conducting independent and joint sampling activities, conducting independent and joint community relations activities in order to keep citizens and media informed of response activities. Additionally, they have provided notifications and assisted affected users of the status of the river system, and established call centers for questions from the public. These partners also have provided and are continuing to provide Public Information Officers, and other support activities. All of these activities have been and are conducted both jointly and independently from the EPA activities.

### **2. Potential for Continued State, Tribal, or Local Response**

State, Tribal, and Local authorities will be needed as the emergency action concludes and the longer term activities continue. These partnerships are vital as the EPA seeks consultation and recommendations to determine the long term activities to assess impacts from this release as well as the impacts from the longer term releases occurring from historical mining operations on the river

system.

### **III. THREATS TO PUBLIC HEALTH OR WELFARE OR THE ENVIRONMENT, AND STATUTORY AND REGULATORY AUTHORITIES**

Conditions at the Site present a threat to public health and the environment, and meet the criteria for initiating a removal action under 40 CFR 300.415(b)(2) of the NCP.

EPA has considered all the factors described in 40 CFR 300.415(b)(2) of the NCP and determined that the following factors apply at the Site.

“(i) Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances, or pollutants or contaminants;”

As a precautionary measure, drinking water treatment systems downstream of the Gold King Mine along the Animas and San Juan River Systems closed water intakes. This was done to avoid receiving contaminated raw water and continued until the pulse of the spill passed by the intakes and the raw water was determined safe to reopen the intakes. Likewise, agricultural users shut off water intakes to avoid irrigating crops or watering their livestock with contaminated water until the raw water was determined safe.

Although there have been no documented impacts to aquatic wildlife associated with the release, it is recognized that many of these impacts could be identified at a later date. It is important to note that prior to this release, the results of a Screening Level Ecological Risk Assessment (“ERA”) (February 2013) strongly suggest that fish populations exhibited high levels of stress at the concentrations of metals present in the Animas River. The surface water hazard quotient for zinc in the Animas River below the confluence with Cement Creek was approximately four, which is four times the expected no-effects level. In addition, the ERA identified aluminum, copper, lead, and zinc as the major risk drivers for insectivorous birds ingesting surface water, sediments, and aquatic invertebrates from the Animas River at and below Silverton.

“(ii) Actual or potential contamination of drinking water supplies or sensitive ecosystems;”

As a precautionary measure drinking water treatment systems downstream of the Gold King Mine along the Animas and San Juan River Systems closed water intakes as determined by the local, State, and Tribal authorities after consultation with EPA. This was done to avoid receiving contaminated raw water and continued until the pulse of the spill passed by the intakes and the raw water was determined safe to reopen the intakes.

Metal concentrations measured both before and after the release in the substrate of the Animas River at and below Silverton are highly toxic to benthic invertebrates. Fish population studies conducted by the Colorado Division of Wildlife prior to the release found no fish in the Animas River below Cement Creek for approximately two miles.

“(vii) The availability of other appropriate federal or state mechanisms to respond to the release;”

The local, state, and tribal governments are assisting the EPA to the extent possible and providing valuable assistance to EPA both from an operational and public information dissemination standpoint by insuring that the local citizens and tribal members that have been impacted are provided with appropriate assistance.

#### **IV. ENDANGERMENT DETERMINATION**

Actual or threatened releases of hazardous substances from this Site, if not addressed by implementing the response action described in this Action Memorandum, may present an imminent and substantial endangerment to public health, or welfare, or the environment.

#### **V. EXEMPTION FROM STATUTORY LIMITS**

Site conditions meet the emergency exemption criteria specified in this request for an exemption from the 12-Month and \$2 million statutory limit. The emergency exemption criteria are the following: (i) continued response actions are immediately required to prevent, limit, or mitigate an emergency; (ii) there is an immediate risk to public health or welfare or the environment; and (iii) such assistance will not otherwise be provided on a timely basis.

##### **A. Emergency Exemption**

1. There is an immediate risk to public health or welfare or the environment: The sudden release of up to 3 million gallons of acid mine water and the potential that there may be additional blockages within the Gold King Mine that could release additional acid mine water present an immediate risk to public health or welfare or the environment
2. Continued Response Actions are Immediately Required to Prevent, Limit, or Mitigate an Emergency: The sudden release of the acid mine water from the adit left the unstable mine portal open and exposed to the elements, allowing it to continue to weather and further collapse. The flood of acid water eroded the steep mine slopes, ripped through and de-stabilized the existing on-site waste rock dump, and washed out the mine road as it flowed downhill. Much of the sediments and rock from the waste dump and the road were deposited into the Cement Creek drainage. After the sudden release, the acid mine water flowing from the portal increased substantially from approximately 50 gpm to 550 gpm and has remained at this flowrate ever since. Imminent winter conditions (up to 12 feet of snow through the winter) followed by spring snowmelt will result in substantial additional erosion and de-stabilization of the waste dump and mine slopes. Continued work to stabilize the mine site and workings before winter conditions shut down response actions are required to ensure protection of downstream human

health, welfare and the environment. The necessary response actions will not be completed prior to the winter shutdown and will require the additional work to resume in July 2016 to complete the stabilization and removal work necessary to prevent future ongoing releases from the mine.

3. Such assistance will not otherwise be provided on a timely basis: There are currently no other entities other than EPA that have the funding to adequately address this issue. Other entities may be able to provide ongoing technical assistance to EPA but are limited by funding.

## **VI. PROPOSED ACTIONS AND ESTIMATED COSTS**

### **A. Proposed Actions**

#### **1. Proposed Action Description**

##### Region 8 (Colorado, Southern Ute Indian Tribe, Ute Mountain Ute Indian Tribe)

- Stabilize portal with shotcrete and begin ground control in the adit
- Flow control structure: temporary drainage piping in-place, and surge protection/removable flow control design pending
- Perform assessment as appropriate of workings and water sources
- Portal shed structure with lockable gate
- Establish connection to conveyance pipe to temporary water treatment
- Restore access to the Gold King Level 7 Mine
- Reinforce as needed with gabion baskets
- Widen road where appropriate
- Regrade/Stabilize the mine dump
- Survey and develop grading plan
- Grade/stabilize the slopes
- Potentially haul waste rock deposited in the creek channel to the waste dump as appropriate or other repository onsite.
- Continue 24 hour emergency water treatment.
- Planning for water conveyance (HDPE pipe) from portal to temporary treatment area.
- Pipe from Gold King to temporary /interim treatment area.
- Evaluating treatment technologies.
- Interim treatment: Install a water treatment system to treat portal drainage through spring 2016 and as need for stabilization activities in 2016 in Gladstone.
- Develop additional retention pond capacity at Gladstone for temporary treatment options and to handle potential surge events from the Gold King Mines
- Construct suitable storage location for waste rock materials deposited in North Fork/Cement Creek Confluence area.

- Relocate materials to temporary or final storage area in the upper Gladstone level.
- Surface water management / sediment control plans have been developed and are being installed before waste rock removal is started along creek channels.
- Alternative water supply may be provided for human consumption as determined appropriate by EPA with consultation with the States of Colorado; and, the Southern Ute and Ute Mountain Ute Tribes;
- Alternative water and feed may be provided for livestock as determined appropriate by EPA with consultation with the States of Colorado, and, the Southern Ute and Ute Mountain Ute Tribes;
- Alternative water supply may be provided for agricultural irrigation as determined appropriate by the EPA with consultation with the States of Colorado, and, the Southern Ute and Ute Mountain Ute Tribes;
- The EPA, in consultation with the States of Colorado, Arizona, Utah, New Mexico, Southern Ute Tribe, Ute Mountain Ute Tribe, and the Navajo Nation, will evaluate alternatives and fund as necessary the installation of a river water alert system to warn downstream stakeholders of high turbidity conditions resulting from response work at the Gold King Mine site.

#### Region 6 (New Mexico)

- Alternative water supply may be provided for human consumption as determined appropriate by EPA with consultation from the State of New Mexico, as applicable;
- Alternative water and feed may be provided for livestock as determined appropriate by EPA with consultation from the State of New Mexico, as applicable;
- Alternative water supply may be provided for agricultural irrigation as determined appropriate by the EPA with consultation with the State of New Mexico, as applicable;

#### Region 9 (Navajo Nation)

- Alternative water supply may be provided for human consumption as determined appropriate by EPA with consultation with the Navajo Nation, as applicable;
- Alternative water and feed may be provided for livestock as determined appropriate by EPA with consultation with the Navajo Nation, as applicable;
- Alternative water supply may be provided for agricultural irrigation as determined appropriate by the EPA with consultation with the Navajo Nation, as applicable.

## **2. Contribution to Remedial Performance**

This effort will, to the extent practical, contribute to any future remedial effort at

the Site.

### **3. Engineering Evaluation/Cost Analysis (EE/CA)**

An EE/CA is not required for a c emergency removal action.

### **4. Applicable or Relevant and Appropriate Requirements (ARARs)**

Given the nature of this emergency removal action, all federal and state ARARs were not identified at the time the response was initiated. The EPA shall, to the extent practical, considering the exigencies of the situation, attain applicable or relevant and appropriate requirements (ARARs) under federal environmental or state environmental and facility siting laws that are identified on a timely basis.

### **5. Project Schedule**

Mine site stabilization activities will continue until winter conditions require operations to shut down (approximately October 31<sup>st</sup>). Operations will resume next year as soon as snowmelt allows (approximately July 2016). Other response actions including the supply of alternative water for human consumption, alternative water for crop irrigation, alternative water for livestock consumption, as well as livestock feed, have been substantially completed and may be continued should EPA determine an ongoing need for such actions in consultation with its local, state, and tribal response partners.

## **B. Estimated Costs\***

<b>Region 8</b>	<b>Emergency Ceiling (1)</b>	<b>Proposed Increase</b>	<b>Proposed Ceiling</b>
Contractor costs (ERRS/START)	<b>\$ 5,500,000</b>	<b>\$ 8,606,000</b>	<b>\$ 14,106,000</b>
Other Extramural Costs (USCG Strike Team)	<b>\$ 500,000</b>	<b>\$ 0</b>	<b>\$ 500,000</b>
Other Extramural Costs (ICP Facility)		<b>\$ 300,000</b>	<b>\$ 300,000</b>
Other Extramural Costs (River Alert System for R8, R6, and R9)		<b>\$ 400,000</b>	<b>\$ 400,000</b>
<b>SUBTOTAL</b>	<b>\$ 6,000,000</b>	<b>\$ 9,306,000</b>	<b>\$ 15,306,000</b>
Contingency (20%)	-		<b>\$ 3,061,200</b>
<b>R8 Removal Project Ceiling</b>	<b>\$ 6,000,000</b>		<b>\$ 18,367,200</b>
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<b>Region 6</b>			
Contractor costs (ERRS/START)	<b>\$ 580,000</b>	<b>0</b>	<b>\$ 580,000</b>
<b>SUBTOTAL</b>	<b>\$ 580,000</b>	<b>0</b>	<b>\$ 580,000</b>

Contingency (20%)	\$ 116,000		\$ 116,000
<b>R6 Removal Project Ceiling</b>	<b>\$ 696,000</b>		<b>\$ 696,000</b>
<b>Region 9</b>			
Contractor costs (ERRS/START)	\$ 827,000	0	\$ 827,000
Other Extramural Costs (USCG Strike Team)	\$ 170,000	0	\$ 170,000
Other Extramural Costs (BIA)	\$ 850,000	0	\$ 850,000
Other Extramural Costs (NTUA)	\$ 400,000	0	\$ 400,000
<b>SUBTOTAL</b>	<b>\$ 2,247,000</b>	<b>0</b>	<b>\$ 2,247,000</b>
Contingency (20%)	\$ 449,400		\$ 449,400
<b>R9 Removal Project Ceiling</b>	<b>\$ 2,696,400</b>		<b>\$ 2,696,400</b>
<b>Combined (R8, R6 and R9) Total Removal Project Ceiling</b>			<b>\$ 21,759,960</b>

\*EPA direct and indirect costs, although cost recoverable, do not count toward the Removal Ceiling for this removal action. Liable parties may be held financially responsible for costs incurred by the EPA as set forth in Section 107 of CERCLA

(1) Verbal ceiling obtained

## **VII. EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN**

A delay in action or no action at this Site would increase the actual or potential threats to the public health and/or the environment.

## **VIII. OUTSTANDING POLICY ISSUES**

Removals involving contamination that may affect other sovereign nations, including Indian Tribes, is one of seven categories designated as nationally significant or precedent-setting (NSPS). Specific procedures are required for requesting Headquarters concurrence on these actions.

## **IX. ENFORCEMENT**

A separate Enforcement Addendum provides a confidential summary of current and potential future enforcement actions for the Site.

## **X. RECOMMENDATIONS**

This decision document represents the selected removal action for the Gold King Mine Release Site in San Juan County, Colorado, developed in accordance with CERCLA as amended, and is not inconsistent with the NCP. This decision is based on the administrative record for the Site.

Conditions at the Site meet the NCP section 300.415(b) criteria for a removal action and I recommend your approval of the proposed removal action. The total project ceiling, if approved, will be \$ 21,759,960.

APPROVE

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Mathy Stanislaus  
Assistant Administrator  
Office of Solid Waste Emergency Response

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Date

DISAPPROVE

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Mathy Stanislaus  
Assistant Administrator  
Office of Solid Waste Emergency Response

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Date

**Attachments:**

- Attachment 1: Map of Site
- Attachment 2: Historical Sampling Results from Gold King Mine Acid Mine Drainage
- Attachment 3: Site Photos